CLAIMS

WHAT IS CLAIMED IS:

1. A prosthetic valve comprising:

a radially expandable structural frame defining a longitudinal axis, including an anchor structure having first and a second open ends, a connecting member having first and a second ends, the first end of the connecting member being attached to the second end of the anchor structure, and a cantilever valve strut having first and a second ends, the first end of the cantilever valve strut being cooperatively associated with the second end of the connecting member; and

a biocompatible membrane assembly having a substantially tubular configuration disposed longitudinally about the structural frame, the membrane assembly including a first end having a first diameter and a second end having a second diameter, wherein the first diameter is greater than the second diameter, the first end of the membrane assembly being attached along the second end of the cantilever valve strut.

2. The prosthetic valve of claim 1 wherein the anchor structure is formed from a lattice of interconnected

elements, and has a substantially cylindrical configuration.

3. The prosthetic valve of claim 1 wherein the structural frame comprises a material selected from the group consisting of stainless steel, tantalum, platinum alloys, niobium alloy, cobalt alloy, and nickel-titanium alloy.

4. The prosthetic valve of claim 1 wherein the structural frame comprises a polymer.

5. The prosthetic valve of claim 1 wherein the biocompatible membrane assembly is formed from a flexible membrane-like material.

6. The prosthetic valve of claim 5 wherein the membrane-like material is a biological material.

7. The prosthetic valve of claim 6 wherein the biological material is a vein.

8. The prosthetic valve of claim 5 wherein the membrane-like material is a synthetic material.

9. The prosthetic valve of claim 8 wherein the synthetic material is an elastomeric polymer.

10. The prosthetic valve of claim 8 wherein the synthetic material is a bioabsorbable material.

11. The prosthetic valve of claim 8 wherein the synthetic material further comprises a reinforcement fiber.

12. The prosthetic valve of claim 1 wherein at least a portion of the structural frame is coated with an agent.

13. The prosthetic valve of claim 12 wherein the agent coating contains a therapeutic agent.

14. The prosthetic valve of claim 12 wherein the agent coating contains a pharmaceutic agent.

15. The prosthetic valve of claim 12 wherein the agent coating comprises an agent-eluting layer.

16. The prosthetic valve of claim 1 wherein at least a portion of the membrane assembly is coated with an agent.

17. The prosthetic valve of claim 17 wherein the agent coating contains a therapeutic agent.

18. The prosthetic valve of claim 17 wherein the agent coating contains a pharmaceutic agent.

19. The prosthetic valve of claim 17 wherein the agent coating comprising an agent-eluting layer.

20. The prosthetic valve of claim 1 wherein at least a portion of the membrane assembly is impregnated with a therapeutic agent.

21. The prosthetic valve of claim 1 wherein at least a portion of the membrane assembly is impregnated with a pharmaceutic agent.

22. The prosthetic valve of claim 1 wherein the connecting member is a substantially straight member oriented in a direction substantially parallel to the longitudinal axis.

23. The prosthetic valve of claim 1 wherein the connecting member has a substantially helical shape about the longitudinal axis.

24. The prosthetic valve of claim 1 wherein the first end of the cantilever valve strut is shaped into a semi-circular loop configuration.

25. The prosthetic valve of claim 1 wherein the second end of the cantilever valve strut has a substantially straight shape and oriented in a direction substantially parallel to the longitudinal axis.

26. The prosthetic valve of claim 1 wherein the second end of the cantilever valve strut has a substantially helical shape about the longitudinal axis.

27. The prosthetic valve of claim 1 wherein the second end of the cantilever valve strut has a substantially sinusoidal shape oriented in a direction substantially parallel to the longitudinal axis.

28. The prosthetic valve of claim 1 wherein the second end of the tubular biocompatible membrane has a closed end.

29. The prosthetic valve of claim 1 wherein the second end of the tubular biocompatible membrane has an open end.

30. The prosthetic valve of claim 1 wherein the second end of the tubular biocompatible membrane moves from a substantially open to a substantially closed position by the cantilever valve strut.

31. The prosthetic valve of claim 1 wherein the structural frame further comprising a proximal collar attached to the second end of the connecting member and first end of the cantilever valve strut.

32. The prosthetic valve of claim 31 wherein the structural frame further comprises a centering leg cooperatively associated with the proximal collar.

33. The prosthetic valve of claim 31 wherein the structural frame further comprises a proximal anchor cooperatively associated with the proximal collar.

34. A prosthetic valve comprising:

a radially expandable anchor structure formed from a lattice of interconnected elements, and having a substantially cylindrical configuration with a first and a second open end and a longitudinal axis defining a longitudinal direction extending there between;

a connecting member having first and second ends, the first end of the connecting member being attached to the second end of the anchor;

a cantilever valve strut having first and second ends, the first end of the cantilever valve strut being cooperatively associated with the second end of the connecting member; and

a biocompatible membrane assembly having a substantially tubular configuration disposed longitudinally about at least a portion of the connecting member, the membrane assembly including a first end having a first diameter and a second end having a second diameter, wherein the first diameter is greater than the second diameter, the first end of the membrane assembly being attached along the second end of the cantilever valve strut.

35. A prosthetic valve comprising:

a radially expandable anchor structure formed from a lattice of interconnected elements, and having a substantially cylindrical configuration with a first and a second open end and a longitudinal axis defining a longitudinal direction extending there between;

a collar located proximal to the radially expandable anchor;

a connecting member having a first and a second end, the first end of the connecting member being attached to the second end of the anchor and the second end of the connecting member being attached to the proximal collar;

a cantilever valve strut having a first and a second end, the first end of the cantilever valve strut being attached to the proximal collar, the cantilever valve strut extending in a distal direction substantially parallel to the longitudinal axis; and

a biocompatible membrane assembly having a substantially tubular configuration disposed longitudinally about at least a portion of the connecting member, the membrane assembly including a first end having a first diameter and a second end having a second diameter, wherein the first diameter is greater than the second diameter, the first end of the membrane assembly being attached along the second end of the cantilever valve strut.